

COINS Seminar #1

“Development of nanomedicines for cancer and chelation therapy”

May P. Xiong, Ph.D.

Assistant professor of Pharmaceutical Sciences
School of Pharmacy, University of Wisconsin-Madison

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Venue: Room #57, Engineering building #5,
The University of Tokyo

—Abstract—

Overall, our research is focused on developing nanoparticles for the treatment of cancer and iron overload (i.e. iron chelation therapy). For cancer therapy, this presentation will focus on the development and characterization of a single nanoparticle platform for combination siRNA and small molecule drug delivery, demonstrating its drug versatility and application in treatment of prostate and ovarian cancer. Chelation therapy is potentially relevant to many diseases characterized by metal excesses, such as blood disorders (e.g. iron overload in thalassemia and sickle cell anemia), neurological diseases (e.g. several metal overloads in Alzheimer, Parkinson's, autism) and cancer (e.g. copper excess in angiogenesis). Emerging literature has demonstrated that metals are critically involved in disease progression and maintaining their balance may play an important role in early disease detection and treatment. For this presentation, we will focus on nanomedicines for iron chelation therapy. Mainly, self-assembly and active disassembly of biomaterials offer two main advantages for iron chelation therapy: (1) large molecular nanostructures may drastically extend chelator pharmacokinetics, in comparison to the short half-lives of small molecule chelators, (2) active-controlled disassembly of these large nanostructures into components small enough for renal and fecal clearance is critical for efficient removal of iron-bound polymer chelates, similar to the rapid elimination of small molecule chelators from the body. Because there are only a handful of reports on biomaterials for iron chelation therapy, this part of the presentation will focus on preliminary development and characterization of two promising platforms for iron chelation therapy.



* Organizer: Center of Innovation (COI program)
Kazunori Kataoka, Professor, Graduate Schools of Engineering / Medicine, The University of Tokyo
Kensuke Osada, Associate Professor, Graduate School of Engineering, The University of Tokyo

* For Further Information Contact: COINS Research Support Office E-mail: jimukyoku@coins.t.u-tokyo.ac.jp
Web: <http://www.kawasaki-net.ne.jp/coins/>